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AUTHOR Ahn, Moon-Suk
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ABSTRACT

All facilities of the Ministry of Communications of Korea, which monopolizes telecommunications services in the country, are listed and described. Both domestic facilities, including long-distance telephone and telegraph circuits, and international connections are included. Computer facilities are also listed. The nation's regulatory policies are described, along with the managerial objectives, organizational characteristics and pricing policy of the Ministry. An appendix shows the Ministerial organization in chart form. (SK)

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August 1974

MOON-SUK AHN

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TELECOMMUNICATIONS AND DATA COMMUNICATIONS IN KOREA

by

Moon-Suk Ahn

ABSTRACT

The Ministry of Communications of Korea monopolizes all telecommunication services in Korea.

This report includes all data such as the domestic communication facilities, the internationl facilities of the Ministry, and the situation of data communications in Korea.

And also considerations are given to regulatory policy of telecommunications in Korea in terms of organizational characteristics and pricing policy.

Finally implications for the future is included.

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I. Introduction

The Ministry of Communications monopolizes all telecommunication services in Korea. Hence we can guess the Korean situation in this field if we examine the Ministry of Communications, especially its organization, facilities and projects.[1] These will be described in Chapters II and III.

Korea entered into data communication in 1970 by using telephone lines,[2] and there has been considerable development in that field. The latter part of this report will devote one chapter to its history.

I want to note that the figures used in this report were derived mainly from the Statistical Year Book, 1972, the Ministry of Communications, Seoul, Korea.

Chapter V will deal with the regulatory policy of telecommunications in Korea.

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(1) The Ministry of Communications has its own independent account separated from the general account of the Government, and it can reinvest its profits in the expansion or maintenance of its facilities.
Its main revenues come from communication services, i.e., telecommunication and postal insurance and annuities appropriation.

For more details about the Ministry of Communications, see Appendix A.

(2) In 1970, the computer group of the Korea Institute of Science and Technology (K. I. S. T.) and the budget officials from the Bureau of Budget (B. O. B.) of the Economic Planning Board succeeded in the computerization of the national budget system.
They installed the CDC 200 User's Terminal at B. O. B., the first batch terminal in Korea. The terminal was connected by the leased line of the Ministry of Communications to the main computer of K. I. S. T.

II. The Domestic Facilities of the Ministry of Communications

A. The Ministry has provided two kinds of line services, i.e., public and exclusive (leased line).

As of the end of 1971, there were 7,926 long distance telephone circuits. Among these figures, 5,741 were for public use and 2,185 for exclusive use (1,562 for reserved equipment).

In the same year they had 1,324 telegraph circuits, among which 964 circuits were for public use and 287 for private use.

Long Distance Telephone and Telegraph Circuits

(as of the end of 1971)

	TOTAL	PUBLIC USE	EXCLUSIVE USE	RESERVED
TELEPHONE	7,926	5,741	2,185	1,562
TELEGRAPH	1,324	964	287	73

If we view the circuits by types, then we can have the following table.

Long Distance Telegraph & Telephone Circuits by Types

TELEGRAPH

(as of the end of 1971)

	TOTAL	PUBLIC USE	EXCLUSIVE USE	RESERVED
PICTORIAL	6	5		
SOUND	252	252		
TELETYPE	381	94	287	
HOT LINE	90	9		
RADIO	231	231		
RESERVED EQUIPMENT	73			73
TELEX	292	292		

TELEPHONE

(as of the end of 1971)

	TOTAL	PUBLIC USE	EXCLUSIVE USE	RESERVED
PHYSICAL LINE	1,768	1,742	27	
CARRIER	3,072	1,924	248	900
RADIO	91	91		
CABLE	857	241	73	543
COAXIAL CABLE	56	43	13	
MICROWAVE	2,082	1,701	262	119

See Appendix B for the status of the domestic line facilities.

B. In Korea, there are three types of telephone equipment, i.e., automatic, common battery and magnetic.

As of the end of 1971, there were 748,474 telephone equipment (automatic 595,664, common battery 51,349, magnetic 101,461). (1) Among these, 563,129 were for subscribers, 115,129 for P. B. X. stations and 70,218 for extentions.

(1) Usually, the cities with population over 100,000 have been equipped with the automatic telephone, and the rural areas with population less than 100,000 have common battery or magnetic telephone equipment.

Capacity Rate of the Telephone Facilities

(as of the end of 1971)

	NUMBER OF FACILITIES	NUMBER OF SUBSCRIBERS	CAPACITY RATE (%)
AUTOMATIC	457,558	421,014	92.0
COMMON BATTERY	52,010	44,846	86.3
MAGNETIC	126,460	97,269	76.9
TOTAL	636,028	536,129	88.5

As we see from the above table, Korea has a high capacity rate (e.g., in the case of the automatic telephone, it reaches 92.0%). And it could cause problems in telecommunication.

For more details of the communication problems, see Appendix C.

III. The International Facilities of the Ministry of Communications

In 1971, there were 160 international telegraph and telephone circuits. Among these numbers, 7 were for telegraph circuits, 91 for telephone, 1 for photogram, 24 for telex, 35 for circuits, 1 for P.T.S. and 1 for T.V.

The number of international telegraph and telephone circuits by country is as follows.

Number of International Telegraph and Telephone Circuits by Country

	TELEGRAPH	TELEPHONE	PHOTOGRAM	TELEX	CIRCUITS	P.T.S.	T.V.
U.S.A.	1	22		4	6		1
HONG KONG	1	4		2	6		
MANILA	1	1					
TAIPEI	1	2					
HAMBURG	1	1		2	1		
JAPAN	2	60	1	16	22	1	
SAIGON		1					
TOTAL	7	91	1	24	35	1	1

IV. Data Communications

Since Korea did not have a computer big enough to have its own terminals until 1969, the Ministry of Communications gave no consideration to data communications.

However, after K.I.S.T. succeeded in installing and operating the CDC 200 User's Terminal in 1970, the Ministry began to recognize the necessity of data communications and provided services to users.

For example, the K.I.S.T.'s cyber now supports a mix of 4 batch terminals and 7 interactive display terminals by using the M.O.C.'s facilities. The 4 batch terminals are using leased lines and one of the display terminals is using dial-up telephone line.

In addition to it, the Korea Exchange Bank is now operating its nation-wide computer network which interconnects its branches by having the NCR Centry 200 Computer as the nucleus and use of micro-wave and leased lines of the M.O.C. as communication means.

Furthermore, the Ministry of Home Affairs, the Union Steel and the Korean Air Lines have plans to set nation-wide computer networks within 1974 by using the M.O.C.'s facilities.

So far, there were no technological problems in data communications in Korea.(1)

---

(1) As a result of K.I.S.T.'s experiment, the M.O.C. already proved that they have data transmission capacity of over 4800 bps. The K.I.S.T. is operating a CDC 732 Medium Speed Terminal which is located in Seoul, and whose data transmission speed is 4800 bps.

For more details, see Appendix D.

The types of terminals and modems available in Korea (especially for K.I.S.T.'s Computer) is as follows:

MODEL 33 TELETYPE.....	ASCII CODE 4-ROW KEYBOARD 100 WPM PRINT
MODEL 38 TELETYPE.....	ASCII CODE 128 CHARACTERS 100 WPM PRINT WIDE RANGE PLATEN
217 DISPLAY TERMINAL...	6 INCHES X 8 INCHES 20 X 50 CHARACTERS BCD CODE KEYBOARD INCLUDED
713 DISPLAY TERMINAL...	8 INCHES X 10 INCHES 640 OR 1,280 CHARACTERS KEYBOARD (ELECTRONICS)
LOW SPEED BATCH TERMINAL	8K MEMORY READING 300 CPM PRINTING 300 LPM DISPLAY CONSOLE
MEDIUM SPEED BATCH TERMINAL	8K MEMORY READING 500 CPM PRINTING 600 LPM DISPLAY CONSOLE
200 USER TERMINAL.....	READING 333 CPM PRINTING 300 LPM BATCH AND INTERACTIVE OPERATION 6 INCHES X 8 INCHES CONSOLE
HIGH SPEED BATCH TERMINAL	8K MEMORY READING 1200 CPM PRINTING 1200 LPM DISPLAY CONSOLE

MODEM 300.....	UP TO 300 BPS TELETYPE COMPATIBLE
MODEM 2200/24.....	UP TO 2400 BPS MODEM 201 B COMPATIBLE FULL OR HALF DUPLEX
MODEM 4600/48.....	UP TO 4800 BPS FULL OR HALF DUPLEX

We can study the Cyber 72-14 System of the K.I.S.T. which has one of the pioneer terminal networks in Korea in Appendix D.

V. Regulatory Policy of Telecommunications in Korea

In Korea, the regulations needed in managing the Ministry of Communications, the monopolistic supplier of all telecommunication services, are provided by Law.

In this chapter, some characteristics of the regulations causing constraints in the design of a possible data communication network in Korea.

V-1. Managerial Objectives

To promote public interest, convenience and necessity in the field of telecommunications are the goals that the Ministry pursues.

But in reality, because of the special situations facing Korea, the Ministry emphasizes its managerial goals on the two other aspects, i.e., effectiveness of national defense[1] and rapid economic development.[2]

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(1) The M.O.C. already maintains extra emergency telephone lines that cover all Korean Villages and are buried underground for preparing for national emergencies.

(2) Decentralization of industries in the rural areas is one of the targets of the Korean Government in the economic field since there exists vast disparity between urban and rural areas due to rapid economic development during the past decade.

The Korean Government selected several rural areas as industrial complexes and has been providing every possible incentive, e.g., total exemption from the Land Speculation Control Tax, exemption from the Corporate Income Tax for 3 years and taxes reduced by 50 percent for the following 2 years and exemption from the Registration Tax, Property Tax and Land Acquisition for 5 years.

Therefore, the need for telecommunications between the headquarters located in large cities (mainly Seoul) and the factories located in the rural industrial complexes is rapidly increasing these days. The relative importance of telecommunications in the economic field has also increased.

V-2. Organizational Characterisitcs

As we see in Appendix A and B, all services of telecommunications are controlled by the seven regional communications offices.

Since the regional offices are only the regional headquarters that control the field offices, real services are provided by the post office, telephone office, telegraph office, telephone and telegraph office, and local telephone and telegraph construction and maintenance offices.

And as the M.O.C. has its own independent account which can be separated from the general account of the Government, they can operate their facilities autonomously.

But in the event of a use rate change, they must first get permission from the Economic Planning Board.

All activities of the Ministry are supervised by the various national organizations, i.e., the National Audit Office, Ministry of Administrative Affairs, Economic Planning Board and the Ministry of Finance, as well as the National Assembly.

If they have net profits from the operation (as is usual) they can use it for the expansion of the facilities for the users with the permission of the Economic Planning Board.

Surplus profits return to the Government's general account as transfers from the special accounts.

V-3. Pricing Policy

In Korea, the telephone number is a kind of shares to the telephone facilites that are maintained for services for the telephone number.(1)

Though the official price of telephone services paid to the M.O.C. is moderate, the selling price of telephone numbers is enormously high.(2)

---

(1) Since there is high demand for telephone numbers, the M.O.C. adopts a policy in which all investment for construction is recovered immediately.

In order to avoid possible disorder, the Ministry uses random numbers in allocating available telephone numbers to the users.

Since the telephone number is a kind of shares to the telephone facilities, the users can sell the number to other users freely after the user uses the number for a certain period that is described in the Ministry's regulations.

(2) We can find very interesting shops in Seoul which deals with telephone numbers as well as hardware.

In some areas in Seoul, the price of a telephone number is almost equivalent to $2,000.

Recently, the Ministry prohibited selling telephone numbers to other persons other than the regional telephone office in order to reduce the false demand. (There were numberous false demands for telephone numbers due to the large gap between the official price and the selling price in the market.)

For long distance calls, the M.O.C. charges according to the time of connection and the distance between the calling number and called number.

Within the cities, which have automatic equipment, the users pay their monthly bills according to the number of calls.

To the users living in other cities, fixed monthly bills are issued.

VI. Summary and implications for the future

A. The Ministry of Communications has all the power necessary to conduct business in the field of telecommunication, including control of the radio.

B. Technologies needed in operating the M.O.C. are imported from foreign countries such as U.S.A., West Germany and Japan.

C. Because of the rapid economic development in Korea, there has been excess demand for telephones in the past decade, which causes a heavy burden on the facilities and has brought about many telecommunications problems.

D. The history of data transmission is short in Korea but there has been rapid expansion in the past few years.(1)

---

(1) In 1968, the Ministry of Science and Technology established the Coordinating Committee of Electronic Data Processing System in order to prevent the possible disadvantages that might arise in the computer field. The C.C.E.D.P.S. is composed of government officials, scholars and directors of computer centers.

All users who want to install computers must submit their plan about computer usages to the C.C.E.D.P.S. with the estimated demand for the computer and the availability of other computer facilities which can provide necessary computer services for the users. The Committee has the power to veto any plans submitted by the user.

In case the Committee rejects the user's plan, the user cannot install computer facilities.

The C.C.E.D.P.S. provides all information about E.D.P.S. to potential users to check false information from computer manufacturers.

Largely because of the activities of C.C.E.D.P.S., Korea can avoid waste that might bring harmful effects to the computer field.

The basic policies of the C.C.E.D.P.S. can be summarized in the following way.

1. Maximum utilization of the existing computer facilities.
2. Encouragement of using computer terminals rather than independent computers.
3. Promoting compatibilities among different computers.
4. Direct the computer industry toward the export of software and hardware.

Since all telecommunication services are monopolized by the M.O.C., all services needed in data transmission have been provided by the M.O.C.

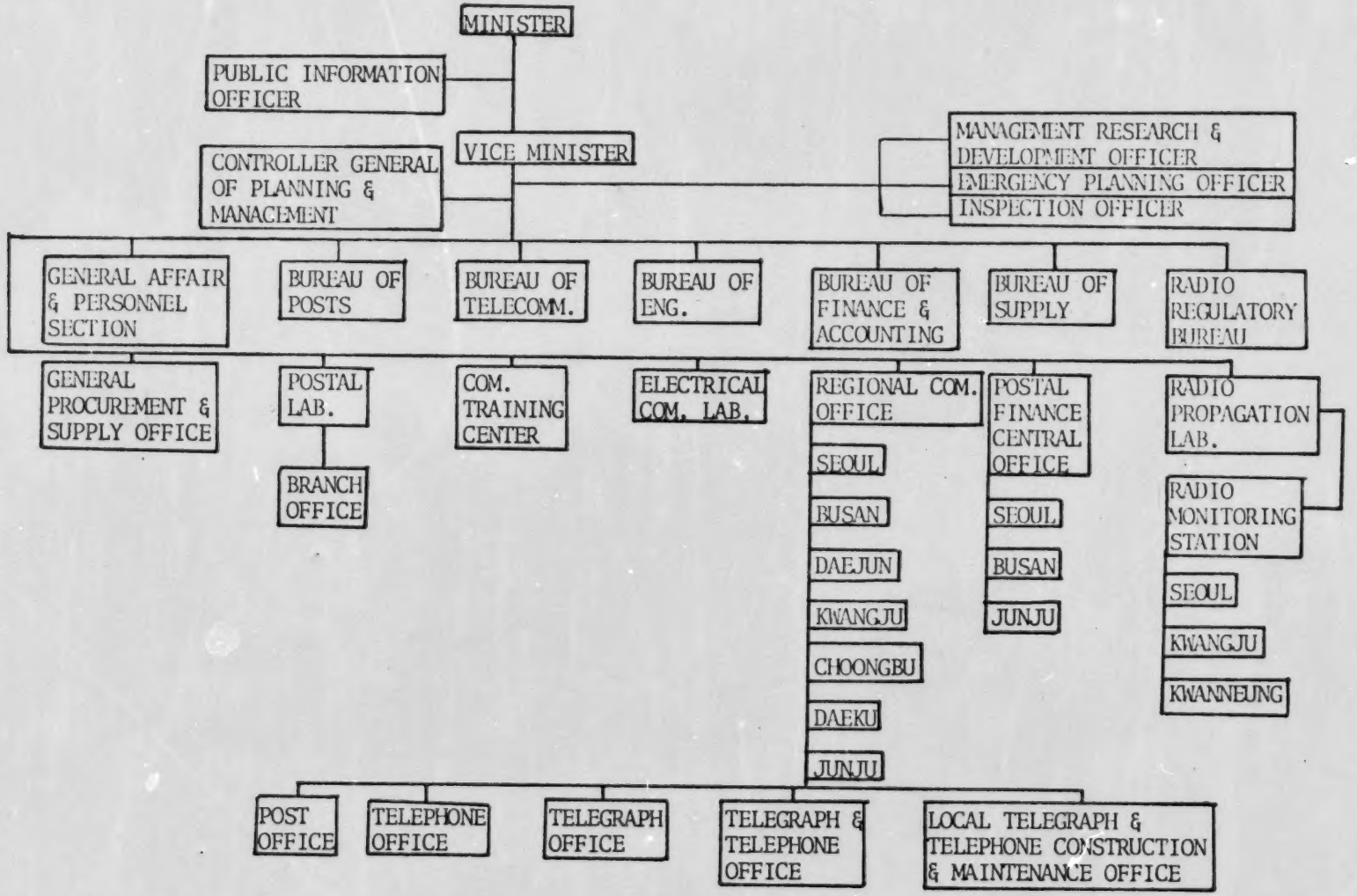
Until now, the leased line was popular in transmission, but the microwave is drawing the attention of the network planner these days.

F. To date, there have been no technological problems in data transmission.

G. There will be extensive usage of computer terminals in the near future.

Appendix A

ORGANIZATION OF THE MINISTRY OF COMMUNICATIONS



APPENDIX B

STATUS OF DOMESTIC LINE FACILITIES WITHIN CITY

URBAN AERICT CABLE (M)	4,874,548.7	
URBAN UNDERGROUND CABLE (M)	2,137,285.4	
URBAN OPEN WIRE (M)	9,636,049	
URBAN UNDERGROUND CONDUIT(M).....	6,679,345.2	
INTER OFFICE RELAY CABLE (M).....	670,944.7	
URBAN POLES	205,887	
URBAN MAN HOLE	6,529	
URBAN HAND HOLE	5,933	
DISTRIBUTING TERMINAL BOX	56,601	
SUBSCRIBER'S LINE EXTENSION (M)	281,511	(1970)
RUBBER SHIELDED OPEN WIRE(M).....	305,674	
SUBSCRIBER'S TELEPHONE EQUIPMENT	670,687	

STATUS OF DOMESTIC LINE FACILITIES FOR LONG DISTANCE LINE

LONG DISTANCE CABLE (M)	.....	933,440.1
UNLOADED CABLE (M)	.....	877,060
COAXIAL CABLE (M)	.....	231,718
LONG DISTANCE OPEN WIRE LINE (M.O.C.)	.....	620,614
LONG DISTANCE OPEN WIRE LINE (CONTRACT)	.....	832,404
LONG DISTANCE POLES	.....	252,226
CROSSARMS	.....	423,031
LONG DISTANCE PORCELAIN INSULATER	.....	2,082,807
LONG DISTANCE UNDERGROUND CONDUIT	.....	636,479

APPENDIX C

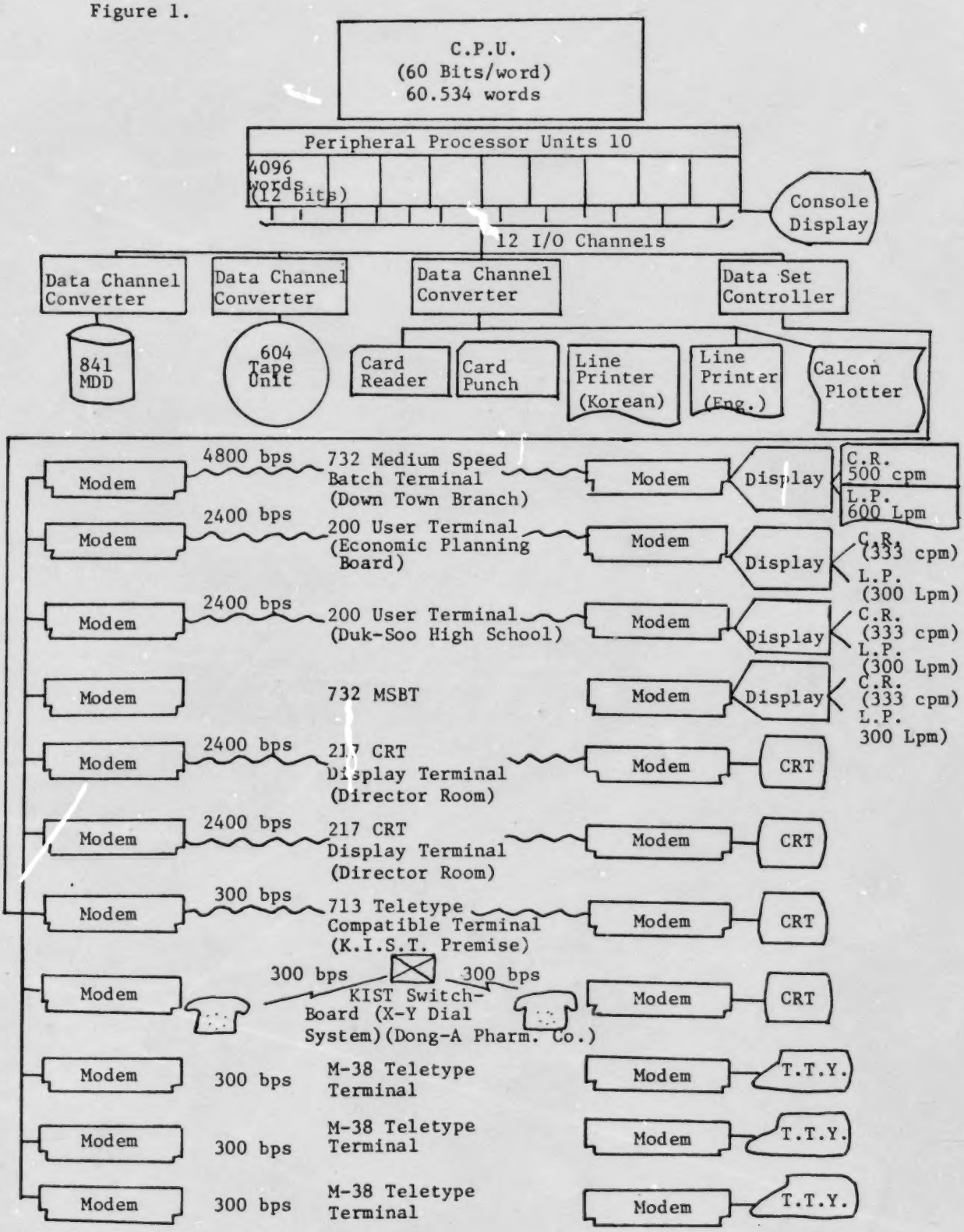
STATUS OF TROUBLES OF THE FACILITIES OF TELEGRAPH & TELEPHONE

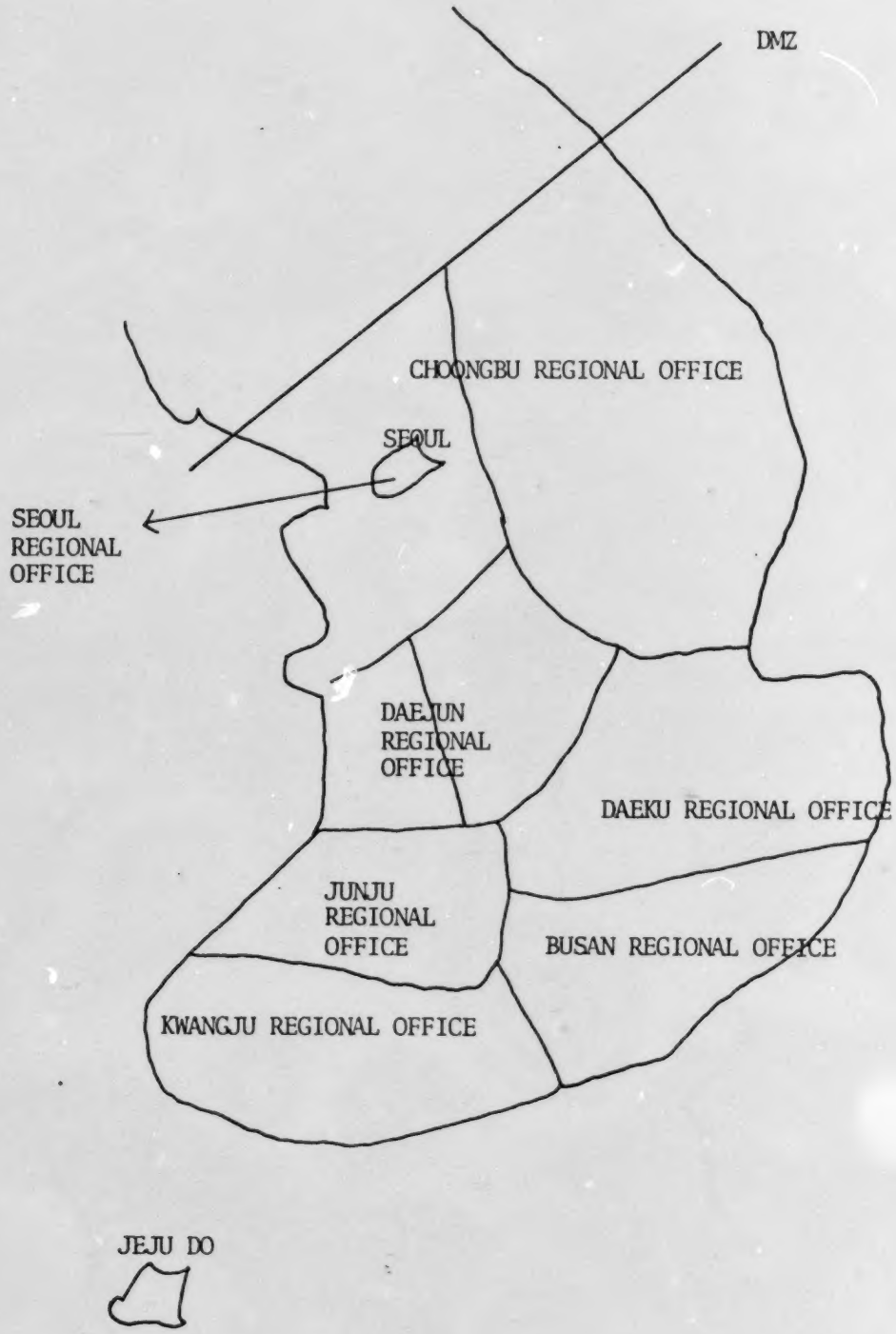
	TELEGRAPH		TELEPHONE	
	NO. OF CASE	TIME	NO. OF CASE	TIME
LINE	619	2,000:51	3,984	13,404:13
POWER SOURCE	70	134:58	522	1,061:40
CARRIER	250	516:26	1,100	1,902:34
DOMESTIC	94	114:10	559	1,145:13
RADIO RELAY	4	42:20	456	182:10
TELEGRAPH MACHINE	254	1,342:50		
PRIVATE STATION	81	271:15	99	608:10
NATURAL RECOVERY	176	160:35	338	612:20
TOTAL	1,548	4,583:25	7,058	18,916:20

APPENDIX D

CYBER 72-14 SYSTEM AND IT'S TIME-SHARING TERMINAL NETWORK

Figure 1.

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